

WHAT IS CLAIMED IS

1. A semiconductor chip mounting apparatus for mounting a semiconductor chip on a substrate by flip-chip bonding comprising:

 a stage on which the substrate is carried,
 a visible light source for directly illuminating the substrate from above the stage,

 a semiconductor chip conveying means for holding from one surface said semiconductor chip comprised of silicon formed to a thickness through which visible light can pass and conveying it on said substrate carried on the stage,

 a capturing means arranged at a position facing said stage and capturing visible light passing through said semiconductor chip held by said semiconductor chip conveying means so as to capture patterns formed on the substrate carried on said stage and said semiconductor chip, and

 a positioning means for positioning said semiconductor chip on said substrate based on the patterns of said substrate and said semiconductor chip captured by said capturing means.

2. A semiconductor chip mounting apparatus as set forth in claim 1, wherein the thickness of the semiconductor chip is 5 to 20 μm .

3. A semiconductor chip mounting apparatus as set forth in claim 1, wherein said visible light includes light of a wavelength of 660 to 760 nm.

4. A semiconductor chip mounting apparatus as set forth in claim 1, wherein said semiconductor chip conveying means clamps and holds said semiconductor chip at a plurality of locations.

5. A semiconductor chip mounting apparatus as set forth in claim 4, wherein said semiconductor chip conveying means is provided with at least one transparent part and clamps and holds said semiconductor chip at its entire surface other than said transparent parts.

6. A semiconductor chip mounting apparatus as set forth in claim 1, wherein said semiconductor chip conveying means has a transparent part through which visible light passes up to the held semiconductor chip.

7. A semiconductor chip mounting method for mounting a semiconductor chip on a substrate by flip-chip bonding including the steps of:

holding a semiconductor chip comprised of silicon formed to a thickness passing visible light by a semiconductor chip conveying means from one surface and conveying it on a substrate carried on a stage,

directly illuminating said substrate with visible light from above the stage,

capturing visible light passing through said semiconductor chip by a capturing means arranged at a position facing said stage and thereby capturing patterns formed by said substrate and said semiconductor chip and positioning said semiconductor chip on said substrate based on said patterns, and

attaching said semiconductor chip to said mounting position on said substrate.

8. A semiconductor chip mounting method as set forth in claim 7, wherein the thickness of the semiconductor chip is 5 to 20 μm .

9. A semiconductor chip mounting method as set forth in claim 7, wherein said visible light includes light of a wavelength of 660 to 760 nm.

10. A semiconductor chip mounting method as set forth in claim 7, wherein said semiconductor chip conveying means clamps and holds said semiconductor chip at a plurality of locations.

11. A semiconductor chip mounting method as set forth in claim 10, wherein said semiconductor chip conveying means is provided with at least one transparent part and clamps and holds said semiconductor chip at its entire surface other than said transparent parts.

12. A semiconductor chip mounting method as set

forth in claim 7, wherein:

 said semiconductor chip conveying means
has a transparent part through which visible light passes
up to the held semiconductor chip and

 said positioning step passes visible light
passing through said semiconductor chip through said
transparent parts and captures it by said capturing
means.